REMARKS

Claims 1-16 are pending in the Application. Independent claims 1 and 11 have been amended. Claims 1 and 11 have been amended to even more clearly recite the selective separation aspect of the claimed invention. Specifically, claims 1 and 11 have been amended to include the feature that the plurality of particles have different optophoretic constants and that the selective separation of the particles is based on the different optophoretic constants of the particles. "Optophoretic constant" is defined in the specification and refers to the parameter or parameters which distinguish or characterize particles for optical selection, identification, characterization, or sorting. See specification, ¶ 83. In the context of a living cell, the optophoretic constant uniquely reflects the physiological state of the cell at the time of interrogation. See specification, ¶ 22. Paragraph 22 of the specification is provided below and illustrates how particles such as cells can be analyzed and isolated based on the optophoretic constant:

> This technology represents a practical approach to probing the inner workings of a particle, such as a living cell, preferably without any dyes, labels or other markers. The "Optophoretic Constant" of a cell uniquely reflects the physiological state of the cell at the exact moment in which it is being analyzed, and permits investigation of the inner workings of cells. These techniques allow simple and efficient gathering of a wide spectrum of information, from screening new drugs, to studying the expression of novel genes, to creating new diagnostic products, and even to monitoring cancer patients. This technology permits the simultaneous analysis and isolation of specific cells based on this unique optophoretic parameter. Stated otherwise, this technology is capable of simultaneously analyzing and isolating specific particles, e.g. cells, based on their differences at the atomic level. Used alone or in combination with modern molecular techniques, the technology provides a useful way to link the intricate mechanisms involving the living cell's overall activity with uniquely identifiable parameters. (emphasis added).

Interview Summary

Initially, Applicants gratefully acknowledge the courtesies extended by the Examiner in permitting Applicants' representative to discuss the pending rejections of the claims by way of a telephonic interview held on August 6, 2003. In the interview, Applicants' representative noted that the claimed invention permits the selective collection and sorting of particles using a moving optical gradient. The method and device permit the characterization, sorting, and ultimate collection of particles based on the unique properties of the particles themselves. An actual real world application of the device and method includes, for example, the characterization and sorting of cancer cells based on their unique optical properties. This can all be accomplished without the need for expensive and destructive labels or tags.

The provisional double-patenting (obvious-type) rejection of claims 1-16 over certain claims in co-pending U.S. Application Serial No. 09/845,245 was discussed. It was agreed that the provisional double-patenting rejection would be removed.

The rejection of claims 1-16 over U.S. Patent No. 6,055,106 (Grier et al.) in view of U.S. Patent No. 6,399,397 (Zarling et al.) was also discussed. Applicants' representative pointed out that Grier et al. failed to disclose the feature of selectively separating particles away from a first surface using a moving optical gradient field. The Examiner contended that the laser traps/tweezers of Grier et al. could be used to move particles away from other particles and thereby selectively separate particles from one another. Applicants' representative pointed out that such separation would not be selective separation as contemplated by the claimed invention. One would have to know, prior to moving the laser

trap, which particle had the desired property. It was pointed out that, in the present invention, the selective separation of the particles is accomplished by a moving optical gradient field that interacts with particles having different properties (recited now as optophoretic constants) which affect their interaction with the moving optical gradient. The Examiner agreed that Grier et al. did not disclose a method or device that selectively sorted particles based on different optical properties of the particles. It was suggested that the claims be amended to more clearly define this selective separation aspect.

With respect to Zarling et al., Applicants pointed out the differences with respect to the claimed invention. These differences included, among other things, Zarling et al.'s reliance on probes/labels which the present invention avoids as well as the fact that Zarling et al. relies on a wicking force (as opposed to a moving optical gradient field) to move analytes from a sample to a capture surface.

Prior Art Rejections

Claims 1-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Grier et al. in view of Zarling et al. Applicants have now amended independent claims 1 and 11 to recite the feature that the plurality of particles have different optophoretic constants and that the selective separation is based on the differences in optophoretic constants in the particles being interrogated. Selective separation is effectuated based on an individual particle's interaction with the moving optical field. The individual particle's interaction is based on the particle's optophoretic constant. Depending on the optophoretic constant of the particles, some particles remain disposed on a first surface while others move away from the first surface (i.e., toward the second adhesive surface).

As discussed and agreed to in the August 6, 2003 interview, Grier et al. fails to disclose or otherwise suggest this claimed feature. Moreover, Zarling et al. is inapplicable because it relies on a wicking force to move particles within the hand-held probe. Zarling et al. uses laser light merely to excite materials that are capable of multiphoton excitation and have upshifted emission spectra. Col. 5, lines 46-48. Neither Grier et al. nor Zarling et al. individually or combined disclose a device or method that collects or sorts particles based on their optophoretic constants using a moving optical gradient.

Double Patenting Rejection

The provisional double patenting rejection is now moot in light of the Examiner's indication that it would be removed.

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Conclusion

The amendments to the claims were not made earlier because Applicants believed that the prior claims adequately captured the selective separation aspect of the invention. Moreover, the present amendments are necessitated by the Examiner interview which took place on August 6, 2003. Finally, the amendments made herein present the rejected claims in better form for consideration on appeal, if necessary. Applicants, however, submit that the claims are allowable over the art of record. A notice of allowability is respectfully requested.

Respectfully submitted,

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